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<u>River</u>	<u>State</u>	<u>River</u>
No. 1. Iowa.	23. Ohio, N.Y.	Allegheny.
Miss. 2. Missouri.	24. Maryland, N.Y.	Monongahela.
Miss. 3. Kentucky.	25. Great Lakes, N.Y.	Northwest.
Miss. 4. Illinois.	26. Kentucky, Ky.	Kentucky.
Miss. 5. Tennessee.	27. Maryland, Ky.	Sum.
Miss. 6. Georgia.	28. Kentucky, Ky.	Carrollton.
Miss. 7. Virginia.	29. Kentucky, Tenn.	Chick.
Ind. 8. Indiana.	30. Kentucky, Tenn.	Tennessee.
C. 9. Michigan.	31. Kentucky, Miss.	Sum. River.
No. 10. Ohio.	32. Kentucky, Miss.	Yago.
	33. Ohio, Miss.	Kathakaloh.

## IMPROVEMENT OF THE MISSISSIPPI RIVER.

MAY 3, 1878.—Recommitted to the Committee on Levees and Improvement of the Mississippi River, and ordered to be printed.

*U. S. Congress, House*

Mr. ROBERTSON, from the Committee on Levees and Improvement of the Mississippi River, submitted the following

### REPORT:

[To accompany bill H. R. 4318.]

To appreciate the national importance of keeping in repair the great river highway between Saint Louis and the Gulf of Mexico, a comprehensive review of the whole Mississippi River system seems necessary. The many navigable tributaries and subtributaries which flow from the region of the Lakes in the North, the Alleghanies in the East, and the Rocky Mountains in the West, converge and unite in one grand trunk-line known as the Lower Mississippi. Many States and Territories have a business interest in this system, and, while sharing its benefits, should also share the damages and cost of repairs. Your committee therefore consider the questions of river-improvement and alluvial lands as intimately and inseparably connected. To treat of one question to the exclusion of the other, and go to an extreme on either side, would be to ignore the fact that business is conservative, made up of checks and balances, facts and figures, and not radical theories.

There are, in print, many official reports of surveys and other authorities on the Mississippi and its various tributaries, but these contain detached information, and no one is sufficiently general and comprehensive to embrace the whole river-system. The magnitude and national importance of the system are too little understood by the general public. To supply that information we have made use of a map and manuscript prepared by Alexander D. Anderson, giving a concise descriptive and statistical review of this great natural and national highway of commerce.

#### HISTORICAL NOTES.

In the early days of European discovery and rivalries, in the Mississippi Valley, its comprehensive river-system played a prominent part on the stage of public affairs. The discovery of the river, in 1541, by the Spaniards under De Soto, was, about a century later, followed by explorations by the French, under the lead of Marquette, Joliet, and La Salle, who entered the valley from the north. La Salle, during the years 1679–1683, explored the river throughout its whole length, took possession of the great valley in the name of France, and called it Louisiana in honor of his King, Louis XIV. Then resulted grand schemes for developing the resources of the valley, which a French writer described as “the regions watered by the Mississippi, immense unknown virgin solitudes, which the imagination filled with riches.” One Crozat, in





1712, secured from the King a charter, giving him almost imperial control of the commerce of the whole Mississippi Valley. There was, at that date, no European rival to dispute French domination, for the English of New England and the other Atlantic colonies had not extended their settlements westward across the Alleghanies, and the Spanish in the Southwest, or New Spain, had not pushed their conquests farther north than New Mexico. Crozat's trading privileges covered an area many times larger than all France, and as fertile as any on the face of the earth. But he was unequal to the opportunity, and, failing in his efforts, soon surrendered the charter. John Law, a Scotchman, at first a gambler, and subsequently a bold, visionary, but brilliant financier, succeeded Crozat in the privileges of this grand scheme, and secured from the successor of Louis XIV a monopoly of the trade and development of the French possessions in the valley. In order to carry into effect his wild enterprise he organized a colossal stock company, called "The Western Company," but more generally known in history as "The Mississippi Bubble." According to the historian, Monette, "it was vested with the exclusive privilege of the entire commerce of Louisiana and New France, and with authority to enforce its rights. It was authorized to monopolize the trade of all the colonies in the provinces, and of all the Indian tribes within the limits of that extensive region, even to the remotest source, of every stream tributary in any wise to the Mississippi." So skillful and daring were his manipulations that he bewitched the French people with the fascination of stock-gambling. But the bubble soon burst, and its explosion upset the finances of the whole kingdom.

The French made little progress in the settlement and development of the great valley, and in 1762 and 1763, after a supremacy of nearly a hundred years, were crowded out by the English from the East, and the Spanish from the Southwest, the Mississippi River forming the dividing line between the conquests of those two nations.

The Spanish officials, for the purpose of promoting colonization, and to aid in establishing trading-posts on the Mississippi, Missouri, Arkansas, Red, and other rivers, in the western half of the valley, granted to certain individuals, pioneers and settlers, immense tracts of land. They accomplished even less than the French in peopling the valley; but whatever progress was made under the successive supremacies of the French, Spanish, and British, the Mississippi and its navigable tributaries furnished the only highways of communication and commerce.

The United States, as a result of the Revolutionary war, dispossessed the British of the eastern half of the valley (except that portion east of the Mississippi and below the 31st degree of north latitude to Bayou Manchac, which remained in undisputed possession of Spain until 1810, when the people of that territory now known as the Florida parishes of Louisiana threw off the Spanish yoke, captured its forts at Baton Rouge and other points of military occupation, and declared and maintained their independence until Governor Claiborne dispersed the legislature and government of the people, and the United States Government extended its authority over the territory, but which Spain did not cede to the United States until 1819), and in 1803, by the treaty of Paris, purchased the western half from France, which she, three years before, had reacquired from Spain. Then began a thorough development of the valley, and the thrifty American civilization made good use of the river highway. It became one of the most important channels of commerce in the world; but its prestige was soon eclipsed by the advance of railways,



and for years past the natural highway has been less used than the artificial ones.

At the present time, however, this river-system is once more coming into great prominence, both in a national and international sense. One scheme for its improvement contemplates an outlay of \$45,000,000 in the construction of levees. Another proposes its improvement on the jetty plan with an outlay of \$50,000,000. Still others aim at the removal of sand-bars, snags, shoals, and overcoming the obstructions caused by rapids. Direct shipments of grain are proposed from the center of the valley to Europe. The river is also considered an important factor in the development of direct and increased trade with Cuba, Brazil, Mexico, and other Spanish-American nations. To facilitate these commendable schemes, it is proposed to improve and deepen the channel of the Lower Mississippi, which we have termed the grand trunk-line of the whole system, so that its waters may float ocean-steamers and make continuous the navigation of the great interior of the United States with the Gulf and the Ocean. In brief, the new era of peace, material development, revival of industries, and extension of trade, which is succeeding several years of political strife and business depression, finds in the Mississippi River system a fine field for operations. The problem of cheap transportation, so important to the welfare of the producing classes, looks to the river and its many navigable tributaries for solution. Considering the national importance of that question at the present time, it is safe to assert that the river-system has reached a point in its history where it will soon regain its lost prestige.

#### DESCRIPTIVE NOTES.

The Mississippi and its navigable tributaries intersect and supply with cheap transportation nearly every portion of the vast agricultural region extending from the Lakes to the Gulf and the Alleghany to the Rocky Mountains, an area of about 2,000,000 square miles; in other words, about two-thirds of the area of the whole United States. Strictly speaking, the Mississippi River basin contains but 1,257,545 square miles. That total is, according to Walker's Statistical Atlas of the United States, composed of the following minor basins or subdivisions, viz:

	Square miles.
Lower Mississippi .....	65,646
Upper Mississippi .....	179,635
Missouri .....	527,690
Arkansas .....	184,742
Ohio .....	207,111
Red .....	92,721

But the region drained, and, in a business way, benefited by the Mississippi River system, is more extensive than the mere basins, and it is fairer to use the first mentioned area (which is that given by Foster, in his excellent work on the valley) as the proper measure of territory for the purposes of this review.

The following table shows the number of miles which the river, and each one of its tributaries, is navigable from its mouth to the place designated on the accompanying map, as the head of navigation:

Missouri .....	3,127	Cumberland .....	653
Mississippi .....	2,166	White .....	460
Ohio .....	1,021	Washita .....	445
Red .....	820	Yellowstone .....	438
Tennessee .....	759	Wabash .....	369
Arkansas .....	668	Alleghany .....	325

Minnesota.....	295	Chippewa.....	90
Illinois.....	269	Iowa.....	80
Yazoo.....	240	Saint Francis.....	80
Osage.....	237	Saint Croix.....	65
Sunflower.....	207	Rock.....	64
Tallahatchie.....	200	Kentucky.....	60
Green.....	200	Black (La.).....	54
Wisconsin.....	160	Big Horn.....	50
Black (Ark.).....	136	Clinch.....	50
Monongahela.....	110		
Kanawha.....	94	Total.....	14,086
Muskingum.....	94		

It will be observed that several of the rivers placed on the map are not navigable. Some of them can easily be made so, and when the country becomes more densely populated, doubtless will be suitably improved. The Mississippi River, for instance, can, by use of locks, be made navigable to Leech Lake, about six hundred miles above the present head of navigation. In the same way the navigation of the Missouri, Yellowstone, Red, and other tributaries may be extended. It will also be observed that the mileage, as given in the above table, is to the heads of navigation. In most instances that means continuous navigation, but not always so. For instance the navigation of the Mississippi is broken at Saint Anthony's Falls, and then is resumed and extends to Sauk Rapids. In the Tennessee River there is an interruption at Muscle Shoals, in the State of Alabama, and another below Chattanooga. In the Red River there is also an interruption of continuous navigation. But these breaks in continuous navigation exist in only a few of the above list of tributaries, and can, with little expense, be overcome whenever Congress furnishes the necessary legislation.

Did time permit, it would be interesting to give descriptive notes on each of the thirty-three navigable rivers of the Mississippi system, stating the general features, and characteristics of each, the nature of the interruptions to continuous navigation, the kind of boats used, or capable of being used, on each, the number of miles of navigation, which, by improvements and repairs, might be added to each river, &c. Such a review is much needed in the interest of commerce, and intelligent and adequate legislation, and it is to be regretted that no provision has been made for its preparation.

A noticeable feature of the system, as may be seen on the map, is that on the east and west it nearly connects with rivers flowing into the Atlantic and Pacific. The James River in Virginia so nearly unites with the Kanawha, which is a tributary of the Ohio, that ever since the days of Washington, who originated and first advocated the plan, it has been proposed to connect, in this manner, the waters of the Atlantic with those of the Mississippi Valley. At the present time there is a bill pending before Congress asking that a commission of engineers be appointed "whose duty it shall be to proceed, at once, to make a survey of, and consider and mature plans for the construction of a navigable canal from the Upper Columbia River to the Upper Missouri River." A continuous water-line from New York City to the waters of the Mississippi, by way of Hudson River, the Erie Canal, and the great lakes, has been much discussed, and, in 1874, its construction was strongly recommended by a select committee of the United States Senate.

Thus it is proposed, by supplementing the Mississippi system on the north, east, and west, to extend the water highways of commerce across the Continent, not only from the Lakes to the Gulf, but from Ocean to Ocean.

## A NATIONAL HIGHWAY.

The navigable portions of this vast river-system either intersect or border eighteen States and two Territories. Each one of these States and Territories has an extensive business interest in the Lower Mississippi, or trunk-line, as well as the particular portions of the river highway which touch its own territory. The mileage of the navigable portions of the system which cross or border each State is nearly as follows :

Arkansas.....	1,826	Minnesota.....	660
Missouri.....	1,504	Wisconsin.....	560
Louisiana.....	1,314	Ohio.....	556
Montana.....	1,311	Nebraska.....	400
Illinois.....	1,277	Pennsylvania.....	380
Tennessee.....	1,220	Texas.....	300
Mississippi.....	1,207	Dakota.....	285
Kentucky.....	1,187	Alabama.....	250
Iowa.....	845	Kansas.....	190
Indiana.....	840	West Virginia.....	104

An estimate of the political power of these States and Territories shows how national are the interests attaching to the river. Of the three hundred and one Representatives of the people in the present Congress, the eighteen States and two Territories sent one hundred and seventy-one. This representation is based on population, and, according to the last census, those States and Territories had a population of 22,215,022, against 16,343,349 in the rest of the United States.

Again, a comparison of some of the leading products of those eighteen States with the products of the whole United States illustrates very clearly the national character of this comprehensive highway. According to the recent annual report of the United States Commissioner of Agriculture, they, in 1876, produced 1,123,106,000 bushels of Indian corn of the total 1,283,827,500 bushels produced in the whole Union; in other words, over 87 per cent. of the whole national crop.

The wheat product of the same eighteen States was 200,899,000 bushels against the total 289,356,500 bushels of the whole United States, or sixty-nine per cent. They produced seventy-two per cent. of the total rye product of the United States. During the same year they furnished seventy per cent., or \$19,811,650 of the total \$28,282,968 worth of tobacco produced in the United States. Of the total 4,438,000 bales of cotton grown in the whole United States in 1876, they produced seventy-four per cent., or 3,318,000 bales. As the statistics of pork packing are usually given by cities instead of States, we will take, for a further comparison, the value of live hogs in 1876. According to the same authority, the Commissioner of Agriculture, the value of the hogs of the eighteen States was estimated to be \$137,154,406, and those of the whole Union, \$171,077,196, or seventy-one per cent.

The chief coal-fields of the United States, those of Pennsylvania, Indiana, Ohio, Illinois, and Missouri, are in close proximity to the navigable waters of the Mississippi or its tributaries. The extensive iron deposits of Tennessee, Western Pennsylvania, and Missouri, also adjoin this national highway. It furnishes water communication with the ocean for the commerce and freights of such cities as Pittsburg, Cincinnati, Louisville, Nashville, Memphis, Saint Paul, Keokuk, Omaha, Little Rock, Shreveport, Jefferson (Tex.), Saint Louis, New Orleans, and many others scattered over different portions of the great interior of the United States.

In fact, the river-system itself is national, for it is a highway controlled by the United States, and is subject to the laws of the general govern-

ment instead of the laws of the various States through which it passes. The law as declared in 1870, by the Supreme Court of the United States, in the case of "The Daniel Ball" (10 Wallace, 557), is as follows:

Those rivers must be regarded as public navigable rivers in law which are navigable in fact. And they are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce over which trade and travel are, or may be conducted in the customary modes of trade and travel on water. And they constitute navigable waters of the United States, within the meaning of the acts of Congress, in contradistinction from the navigable waters of the States, when they form in their ordinary condition, by themselves, or by uniting with other waters, a continued highway over which commerce is, or may be, carried on with other States, or foreign countries, in the customary modes in which such commerce is conducted by water.

Here then we find a highway which is controlled by the people instead of private corporations. No monopoly of transportation, or exorbitant charges attach to the river-system, but it is a public way open to free and unrestrained competition. It is in nature, fact, and law, a national institution.

#### ITS INTERNATIONAL FEATURES.

A glance at the map shows how the various branches of this inland highway converge, meet, and finally terminate at the Gulf, directly opposite Brazil, the Spanish-American nations of South America, Mexico, and the West Indies. No intention of nature is more clearly indicated than that the commerce of the great valley should find a direct and continuous interchange with that of neighboring nations at the South. But statistics show that the wise plans of nature have, in this respect, been almost totally disregarded. According to a report on the resources and commerce of Brazil, submitted at our Centennial Exhibition, her average annual purchases in the European market were  $85\frac{29}{100}$  per cent. of her total imports, while her annual average purchases from the United States were only  $4\frac{67}{100}$  per cent.

Taking the statistics of the foreign commerce of Mexico for the year ending June 30, 1873, which is, probably, a fair illustration of the general direction of that trade, we find that Mexico imported to the extent of \$18,897,611 in commodities from distant Europe, and only \$7,420,419 from the United States. Taking the single item of cotton-stuffs imported that same year, Mexico bought \$10,531,970 worth from Europe, and only \$369,438 worth from the United States. Yet her chief harbor, Vera Cruz, is but a very short distance across the Gulf from the mouth of the Mississippi and the best cotton-producing States of the world. The grain products of the valley have, for years past, been sent overland for foreign shipment, while the waters of the river, which penetrates all portions of the grain-producing regions, form an unbroken channel to the ocean.

The people of the valley are beginning to appreciate the fact that it is a costly luxury to ignore the plans of nature, and now, more than ever before, they are considering the international features of the river highway. The recent direct shipments of grain from the mouth of the Mississippi to foreign markets have proved so successful, and so beneficial to the producers of the valley, that it is proposed to improve the river so as to permit ocean-steamers to ascend to the very center of this great river-system. This result could be accomplished by a channel of twenty feet in depth from Saint Louis to the Gulf. One plan of improvement of the Lower Mississippi contemplates such a depth of navigation. But it is not our purpose to advocate any particular theory of

improvement. Suffice it to say that the river should be impressed into the service of commerce in every way possible, and to its utmost capacity whether for local, national, or international exchanges.

An inevitable result of an adequate development and use of this river highway, and enlarged trade with Spanish-American countries adjoining the Gulf, will be the construction of the proposed interoceanic canal across Central America or Southern Mexico. That would make continuous and very direct water communication between the valley and Japan, China, and India. The Mississippi Valley is destined at no distant day to have its share of the much coveted and enriching Oriental trade.

#### AN ECONOMICAL HIGHWAY.

This river system, considered as a whole, extends from north to south, from one climate to another. Nature has provided that different climates shall furnish different products, and it is but in accordance with those designs and sound principles of political economy that the chief commercial exchanges of the United States should be in the same direction. In America, at least, those principles of trade have been disregarded, and the exchanges have been too much on parallels of latitude. But, regardless of what has been the practice, it is a fact which cannot be gainsaid, that the most important trade for the United States to secure is that of the nations lying south of us, and within easy reach of the Mississippi Valley. Of the valley itself it may be said that the northern and southern portions are, in climate, resources, and products, the supplement of each other. Of the valley, and the Spanish-American nations, it may be said that one is, in climate, products, resources, supply, and demand, the complement of the other. The Mississippi River furnishes facilities for exchanges on that principle, and is, therefore, economically correct. True public economy requires that such laws of nature and trade be not disregarded.

Again, this highway is in accordance with the rule of political economy as well as common sense, which is that channels of commerce be located in regions which are sufficiently fertile and settled to furnish products for transportation. The most productive portions of the United States are the rich valleys extending up and down the Mississippi and its many tributaries. The highway was located where most needed, and where it can perform the greatest service in the shape of transportation.

Again, it is in accordance with the strictest principles of political economy in that it was constructed without expense. The single State of New York had, up to the close of 1866, expended \$64,710,832 in the construction, improvement, and enlargement of her 1,308 miles of canals. It will be observed that the mileage of these canals which cost such an enormous sum is not quite one-tenth the mileage of the Mississippi River system which cost nothing.

Still again, sound public economy requires that the cost of transportation be not so great as to check production. The question of cheap transportation has during the past few years been very generally discussed, and a select committee of the United States Senate in 1874 prepared an elaborate report on that subject. In its summary of conclusions and recommendations is the following:

The above facts and conclusions, together with the remarkable physical adaptation of our country for cheap and ample water communications, point unerringly to the improvement of our great natural waterways, and their connection by canals or by short freight railway portages, under control of the government, as the obvious and certain solution of the problem of *cheap* transportation

The following, from the Cincinnati Commercial, of recent date, illustrates the force of that conclusion :

The tow-boat Josh Williams is on her way to New Orleans with a tow of thirty-two barges, containing *six hundred thousand bushels (seventy-six pounds to the bushel)* of coal, exclusive of her own fuel, being the largest tow ever taken to New Orleans, or anywhere else in the world.

Her freight-bill, at *three cents per bushel*, amounts to eighteen thousand dollars.

It would take *eighteen hundred cars*, of three hundred and thirty-three bushels to the car (which is an overload for a car), to transport this amount of coal.

At ten dollars per ton, or one hundred dollars per car, which would be a fair price for the distance by rail, the freight-bill would amount to *one hundred and eighty thousand dollars*, or one hundred and sixty-two thousand dollars more by rail than by river.

The tow will be taken from Pittsburgh to New Orleans in fourteen or fifteen days.

It would require *one hundred trains* of eighteen cars to the train to transport this one tow of six hundred thousand bushels of coal, and even if it made the usual speed of *fast freight-lines*, it would take one whole summer to put it through by rail.

This statement shows the *wonderful* superiority of the river over rail facilities.

The following statistics from the New Orleans market-reports show the increased receipt of some of the articles of produce from the interior, largely due to improvement at the mouth of the Mississippi River.

In other words, the producers desiring cheap transportation will always patronize the river highway when it is in repair.

From September 1, 1877 to April 21, 1878—

		Increase.
Corn, this year, bushels.....	3, 679, 319	
Corn, last year, bushels.....	1, 173, 381	
		2, 505, 938
Wheat, this year, bushels.....	653, 551	
Wheat, last year, bushels.....	93, 725	
		559, 826
Cotton-seed, this year, sacks.....	1, 724, 012	
Cotton-seed, last year, sacks.....	1, 058, 716	
		665, 296
Cotton, this year, bales.....	1, 602, 121	
Cotton, last year, bales.....	1, 323, 819	
		278, 302

#### A NEGLECTED HIGHWAY.

With the great natural advantages possessed by the river-highway, one would naturally suppose it would be the main dependence for the bulky freights of an agricultural valley. But it is the channel of trade least in use. According to the recent report of the United States Bureau of Statistics on internal commerce, the commerce of Saint Louis, the central city of the great Mississippi Valley, was, during the year 1875, transported chiefly by rail, 78 per cent. going by rail, and only 22 per cent. by river. The same report asserts that "at first the railroads of the Western States were regarded as being merely tributary to the water-lines." But the reverse is now true, for since railways have been so generally extended over the valley, from 1850 to the present time, they have gradually gained in relative importance and prestige, until the river has become tributary to the railways. Until recently the mouth of this whole system of water-ways, which connects over fourteen thousand miles of inland navigation with the Gulf and the Ocean, has been permitted to remain filled with bars and deposits, to the great damage of commerce. Along the trunk-line, or Lower Mississippi, the levees, or fences of the river, constructed to protect adjoining fields from overflow, and damage, have become neglected and broken down. The amount of this damage to property, and loss to the sum total of national wealth, is truly astonishing. In estimating the damage one must bear in mind that the alluvial lands along the Lower Mississippi, the Red, and Ar-

kansas Rivers, are as fertile as any upon the face of the earth, and, for the purpose of cotton, sugar, and rice growing, doubtless superior to any. The extent of territory subject to overflow was, in 1874, estimated by Mr. Morey, in his report to the House of Representatives, to be 41, 193 square miles. This is an area as great as the combined areas of New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, and New Jersey, and of course many times more productive. As regards the value of that area, reduced to acres, we quote as follows from Mr. Morey's carefully-prepared estimate :

Assuming the 26,363,520 square acres of land to have been worth, unreclaimed, \$1.25 per acre, on the fronts of streams of the larger class, to an average depth of one mile on each side, amounting to about 8,000 square miles—equal 5,120,000 acres—the whole would be worth, at this rate, about \$6,400,000. Computing the rest as not salable, but worth ten cents per acre—say \$2,124,352; add to this the salable land, and we have an aggregate value of \$8,524,352 as the total value of the Mississippi Delta, without levees.

What was their value at the beginning of the war, with the ineffective levee system then extending something like one thousand miles in Louisiana, and at least five hundred miles in the other States? The lands reclaimed were worth, on an average, \$30 per acre, and the 5,120,000 acres became worth \$153,600,000, and the remaining 21,243,352 acres were worth \$10 per acre, or \$212,443,520, and the real value of the whole area worth \$366,043,520.

Here, then, was an addition to the national wealth of over \$357,000,000 as a result of the reclamation of the alluvial lands. It is an amount greater than the value, as given in the last Census, of all the farming lands of the great and fertile State of Kentucky. But the wealth gained by fencing in the river highway has, since the beginning of the war, been almost entirely lost. According to the able report of the Levee Committee, made to the House of Representatives by Mr. Ellis, in 1876, "millions of acres have been sold for taxes; others, after advertisement, have failed to bring anything whatever, and it is safe to say that the depreciation in the last sixteen years has reduced the value to less than \$100,000,000." Here, then, is a damage of \$266,000,000 to property, caused by failure to keep a public highway in repair—a highway so public that it furnishes transportation to eighteen States, which, as we have already stated, supply, on an average, about 75 per cent. of the staple products of the whole country.

The damage not only consists of devastation to adjoining fields, caused by overflow, but to the levees themselves, which adjoining States and proprietors have constructed at great expense. On this subject Professor Forshey, a distinguished civil engineer of many years' experience and observation on the Mississippi, a very reliable authority, made before the Association for the Advancement of Science in 1872 the following assertion, viz :

The steamers that transport this commerce send their restless waves against banks and levees, lashing and abrading them almost without cessation. Our lower river hardly ever rests. One set of waves succeeds another; and each finds its rest in the equivalent of its forces transferred to the banks and channel of the river. These lashings and abradings, independent of the other causes, render the task of levee construction more and more oppressive yearly, until it has become intolerable.

At the convention which met at Saint Paul, in the fall of 1877, to consider the river interests, he illustrated that assertion by a few facts and figures in regard to the damage to levees along Kempe's plantation, on the Mississippi, and about one hundred miles above the mouth of Red River. He cited that case as a fair illustration of the general damage to levees and alluvial lands caused by the commerce of the eighteen States and two Territories which make free use of this highway. He said :

In 1840 I made a survey of the whole tract of more than 1,200 acres, half in cultivation. The front was protected by a levee only four feet high. Its back line, forty



arpens from the front, nearly one and a half miles, had the original Spanish land marks of 1802. The front had remained thirty-eight years without material change. The currents had done their worst upon them and still the depth of forty arpens was there. In 1872-'73 I located and built a levee, on the front of the same tract, and this was the fourth parallel levee that had been built there since my survey. Its length was four miles, 18 feet its average height (maximum, 22½ feet), and with a base of 130 feet. Its contents were 640,000 cubic yards, and it cost the State of Louisiana \$384,000. In locating the line of the levee I destroyed the back, and marks at forty arpens, 1½ miles from the river front. This whole front had caved none in the thirty-eight years, from the original survey until 1840; and in the thirty-two years of *commercial history* the abrasions has carved away nearly the whole plantation, and eaten down three levees, costing the State and the proprietors more than \$500,000.

#### THE QUESTION OF REPAIRS.

In nearly every portion of this country, and in fact of the civilized world, there is some provision of law in regard to the repairs of public roads. The county, town, city, and private corporation which is benefited by a highway, invariably finds some way to keep it in repair. As the construction of these roads costs large sums of money, it is considered economical, as well as necessary, to take care of them. In brief, the statute law of every State compels the counties, or towns, to keep their roads in good repair, and the failure to do so subjects them to liability for damages caused by the neglect.

There is no good reason why the United States should not take equal care of the great inter-State highways of commerce which she controls by legislation. As regards inter-State commerce, communication, and exchanges between different sections of the nation, and between the interior and the seaboard, the uses of railways are very similar to those of river highways. It is, therefore, fair to contrast these two systems of highways as regards the question of repairs and damages.

The laws of the various States, particularly those which are the oldest and best settled, are very much alike in their requirements of railway corporations on the subject of damages, and fences to protect adjoining property-holders from damage. To illustrate the spirit of the statute laws in this respect, we quote as follows from the laws of Connecticut:

Every railroad company which has been incorporated since the first Wednesday of May, 1850, or which shall be hereafter incorporated, shall erect and maintain good and sufficient fences on both sides of its railroad throughout its whole extent, except at such places as, in the opinion of the railroad commissioners, the erection and maintenance of the same shall be inexpedient or unnecessary.

The statutes of this State further provide for the construction, by the railway companies, of "suitable cattle-guards in the form of culverts or pits, at all places where its railroad shall cross public highways or passways."

In the construction of railways the companies are compelled to pay for the right of way, and to suitably compensate the land-owners whose property they cross for the damages caused. Such is also the spirit of the law in England. The general spirit of the law on this subject is concisely stated, by Bouvier, as follows:

In England the laying out of highways is regulated by act of Parliament; in this country by general statutes, differing in different States. In England the uniform practice is to provide a compensation to the owner of the land taken for highways. In the act authorizing the taking in the United States such a provision must be made or the act will be void, under the clause in the several State constitutions that "private property shall not be taken for public use without just compensation."

It is true that nature, instead of the United States, constructed the river highways. But is that a sufficient reason why the general government, which controls the navigable water-ways, should not protect the adjoining property-holders from damage? Equity requires that the general public which uses and is benefited by this national highway



should fence it in by levees, so as to protect the adjoining fields from overflow and ruin. Congress has already established several precedents showing that it recognizes this general and universal spirit of the laws in regard to public highways and compensation for damages. They are as follows :

The *act of March 2, 1849*, provides "that to aid the State of Louisiana in constructing the necessary levees and drains to reclaim the swamp and overflowed lands therein, the whole of those swamp and overflowed lands which may be, or are, found unfit for cultivation, shall be, and the same are hereby, granted to that State."

The *act of September 28, 1850*, provides "that to enable the State of Arkansas to construct the necessary levees and drains to reclaim the swamp and overflowed lands therein, the whole of those swamp and overflowed lands made unfit thereby for cultivation, which shall remain unsold at the passage of this act, shall be, and the same are hereby, granted to said State." Another section of this act extends its provisions and the grant of swamp lands to the other States of the valley and the Union.

The *act of September 30, 1850*, provides "for the topographical and hydrographical survey of the Delta of the Mississippi, with such investigations as may lead to determine the most practicable plan for securing it from inundation, and the best mode of so deepening the passes at the mouth of the river, as to allow ships of twenty feet draught to enter the same, fifty thousand dollars."

The *act of August 31, 1852*, provides "for continuing the topographical and hydrographical survey of the Delta of the Mississippi, with such investigations as may lead to determine the most practicable plan for securing it from inundation, fifty thousand dollars."

The *act of March 12, 1860*, provides "that the provisions of the act of Congress entitled 'An act to enable the State of Arkansas and other States to reclaim the swamp lands within their limits,' approved September 28, 1850, be, and the same are hereby, extended to the States of Minnesota and Oregon."

The *act of June 22, 1874*, provides "that the President be, and he is hereby, authorized and directed to assign three officers of the Corps of Army Engineers, United States Army, and to appoint two civil engineers, eminent in their profession, and who are acquainted with the alluvial basin of the Mississippi River," &c. \* \* \* "It shall be the duty of said commission to make a full report to the President of the best system for the permanent reclamation and redemption of said alluvial basin from inundation."

The total number of acres selected for the several States, under the provisions of the above-mentioned acts, is 67,683,045. Of that quantity granted, Florida, Oregon, California, and Michigan, States which are not intersected by any portion of the Mississippi River system, received 23,969,528 acres. Of the quantity received by the States interested in the Mississippi and its tributaries, the larger portion was within the alluvial districts dependent upon levees.

Such are the precedents which Congress has established in regard to the subject of alluvial lands. They are sufficiently numerous to indicate an admission by the general government of an obligation to build levees or fences along its great highway of commerce, so as to protect adjoining fields from damage.

The precedents on the subject of river-improvement are much more numerous. From the beginning of the government to the year 1878, there have been nearly two hundred different appropriations by Congress for improvements of the Mississippi and its various tributaries. The total amount of these appropriations for improving 14,086 miles of waterways in the Mississippi system, and which are under control of the United States, is not so remarkable as the number of the appropriations. The amount is, in round numbers, only \$18,500,000, a sum only one-fifth the amount of bonds issued (with interest added) by the United States in favor of the Pacific railroads. It is an amount less than one-third the sum spent by New York State alone on her canals. It is also less than half the sum appropriated by Congress for the improvement of rivers and harbors in other portions of the United States.

A further comparison shows that the single State of New York has

received from the general government for the improvements of its rivers and harbors the sum of \$7,894,603, an amount considerably over one-third the appropriations for the whole Mississippi system, in which eighteen States and two Territories have a business interest.

There is a wide difference in principle between the granting of government aid in the construction of railways owned by private corporations and simply keeping in repair river highways controlled by the United States, and which nature built for her without expense. If precedents show that the general government has pursued a very liberal policy in the first instance, it is certainly apparent that the policy should be liberal in regard to navigable rivers, the ways which furnish cheap and free transportation, and therefore the ways of greatest importance to the producers and the people who pay the taxes. According to the United States Bureau of Statistics, the amount of public lands granted in aid of the construction of railways is, up to the present time, 187,785,850 acres. The amount of bonds issued by the general government to Pacific railways, with interest accumulated, was, at the beginning of last year, \$91,637,928. The single State of New York has, as we have already shown, expended over sixty-four million dollars in the construction of artificial water-ways. The average cost per mile of those 1,308 miles of canal was forty-nine thousand dollars. Suppose the general government had, at the same cost per mile, constructed the 14,086 miles of water highways in the Mississippi River system, the total cost would be *over six hundred and ninety million dollars*. This river highway is infinitely superior to and more serviceable than any canal which can be constructed. Its value is just as great to the people as if built at public expense, and is as much entitled to repairs. Is it wise for the general government to neglect its most important highway of commerce simply because nature assumed the cost of the original construction?

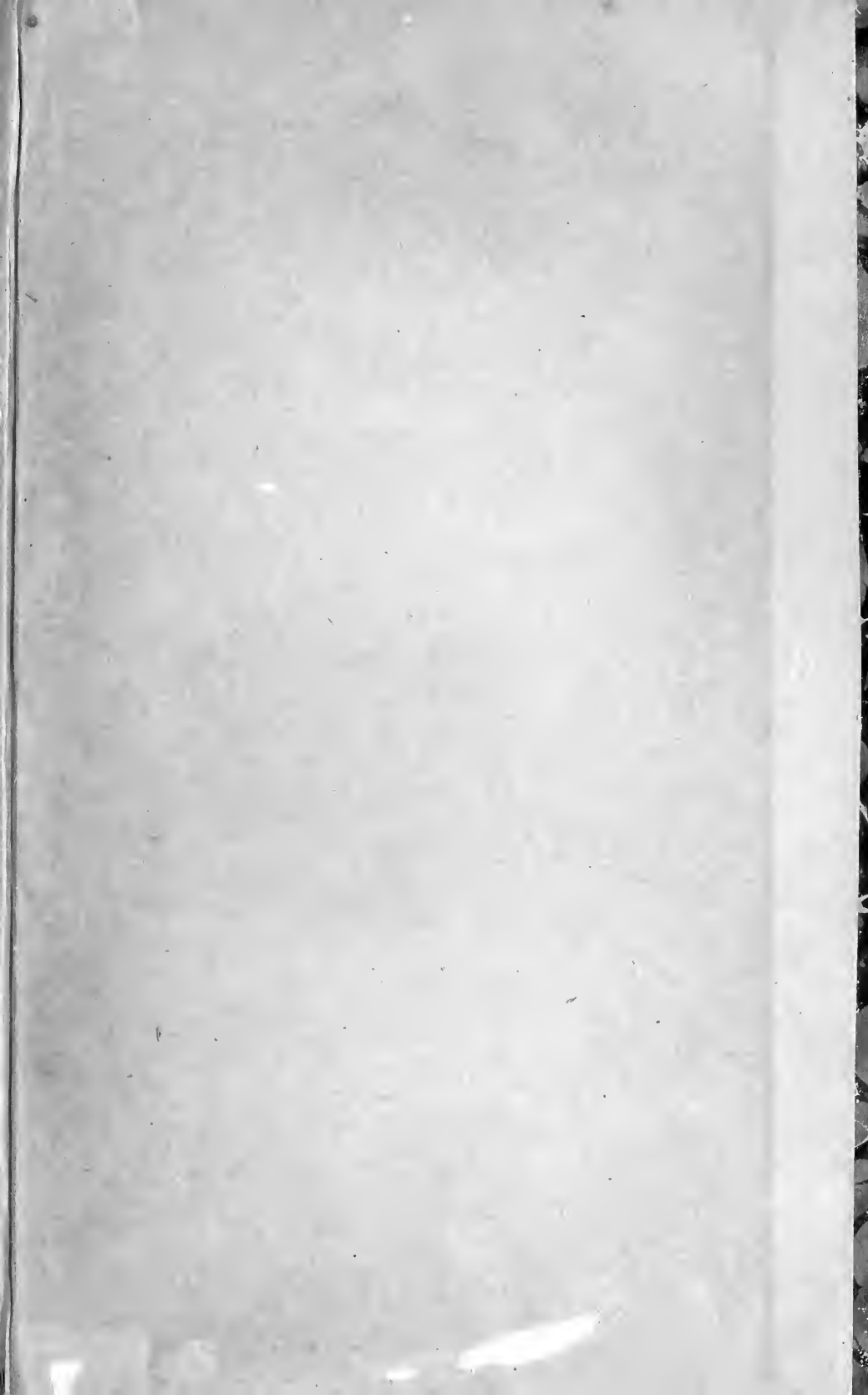
#### CONCLUSION.

The bill reported by your committee is a substitute for the various bills which have been referred to them for consideration.

By resolution of the present session the jurisdiction of the committee has been extended so as to include questions relating to the improvement of the river, as well as questions relating to levees and alluvial lands. In the past these have been rival interests, notwithstanding nature made them interdependent. At present, however, all parties in interest admit that levees are necessary aids to the improvement of navigation. Your committee, therefore, in accordance with their new jurisdiction, and the fortunate adjustment of rival interests, report a bill combining those two very important questions.

Without advocating any particular theories—leaving them for a commission to determine—they do, however, recommend a liberal and comprehensive system of repairs to this great natural and national highway of commerce, which is under the control of the government, and open to the free and unrestrained use of the people.

As preliminary to such a system of internal improvements, they recommend a commission to examine and decide upon some adequate and comprehensive plan of improvement of the Lower Mississippi, from Saint Louis to the Gulf, which is the concentration and trunk-line of the whole Mississippi River system. The bill provides that the commission shall take into consideration plans and estimates for the improvement of the navigation of the river as well as for the protection of the alluvial lands of the Mississippi delta from overflow.



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